

What is claimed is:

- 1 1. A device for cutting or ablating tissue in a human or veterinary patient,
2 said device comprising:
 - 3 an elongate probe having a distal end;
 - 4 a tissue cutting or ablating apparatus; and
 - 5 a protector that extends from the probe, said protector having a first
6 side and a second side, said protector being positionable such that tissue that
7 is to be cut or ablated is adjacent to the first side of the protector and tissue
8 that is to be protected is adjacent to the second side of the protector, said
9 protector being at least partially formed of an insulating material;
 - 10 the tissue cutting or ablating apparatus being useable to cut or ablate
11 tissue that is located adjacent to the first side of the protector without causing
12 substantial damage to tissue located adjacent to the second side of the
13 protector.
- 1 2. A device according to Claim 1 wherein the tissue cutting or ablating
2 apparatus causes thermal cutting or ablation of tissue and wherein the
3 protector is at least partially formed of a thermal insulating material that deters
4 thermal energy from causing substantial damage to tissue located adjacent to
5 the second side of the protector.
- 1 3. A device according to Claim 1 wherein the tissue cutting or ablating
2 apparatus comprises an electrosurgical apparatus and wherein the protector
3 is at least partially formed of an insulating material that deters conduction of
4 electrical power through the protector.
- 1 4. A device according to Claim 1 wherein the protector is formed entirely
2 of insulating material.
- 1 5. A device according to Claim 1 herein the protector is formed of metal
2 that is at least partially covered by an insulating material.

1 6. A device according to Claim 1 wherein the insulating material
2 comprises a at least partial polymer coating.

1 7. A device according to Claim 6 wherein the polymer coating comprises
2 a polyimide coating.

1 8. A device according to Claim 7 wherein the polymer coating is applied
2 to at least a portion of the protector by dipping at least a portion of the
3 protector into a liquid polymer solution which subsequently dries and forms a
4 coating.

1 9. A device according to Claim 1 further comprising an infusion lumen
2 through which fluid can be infused into the patient's body and an aspiration
3 lumen through which fluid can be aspirated out of the patent's body.

1 10. A device according to Claim 1 wherein the tissue cutting or ablating
2 apparatus comprises an electrosurgical tissue cutting or ablating apparatus.

1 11. A device according to Claims 10 wherein the tissue cutting or ablating
2 apparatus comprises a bipolar electrode configuration having first and second
3 electrode surfaces.

1 12. A device according to Claim 10 wherein the tissue cutting or ablating
2 apparatus comprises a monopolar electrode and wherein the device further
3 comprises a return electrode that is electrically couplable to the patient's
4 body.

1 13. A device according to Claim 1 wherein the tissue cutting or ablating
2 apparatus comprises a light emitting apparatus which emits light energy to cut
3 or ablate tissue.

1 14. A device according to Claim 13 wherein the tissue cutting or ablating
2 apparatus emits laser energy.

1 15. A device according to Claim 13 wherein the tissue cutting or ablating
2 apparatus emits light energy that causes thermal destruction of tissue.

1 16. A device according to Claim 13 wherein the tissue cutting or ablating
2 apparatus emits ultraviolet light.

1 17. A device according to Claim 1 wherein the tissue cutting or ablating
2 apparatus comprises an ultrasonic apparatus which uses ultrasound to cut or
3 ablate tissue.

1 18. A device according to Claim 1 wherein the tissue cutting or ablating
2 apparatus comprises a mechanical tissue cutting apparatus.

1 19. A device according to Claim 18 wherein the tissue cutting or ablating
2 apparatus comprises at least one knife blade.

1 20. A device according to Claim 19 wherein the tissue cutting or ablating
2 apparatus comprises at least first and second knife blades located a spaced
3 distance apart to cut a strip of tissue the width of which is substantially equal
4 to the distance between the first and second knife blades.

1 21. A device according to Claim 18 wherein the tissue cutting or ablating
2 apparatus comprises at least one scissor.

1 22. A device according to Claim 21 wherein the tissue cutting or ablating
2 apparatus comprises at least first and second scissors located a spaced
3 distance apart to cut a strip of tissue, the width of which is substantially equal
4 to the distance between the first and second scissors.

1 23. A device according to Claim 18 wherein the tissue cutting or ablating
2 apparatus comprises at least one rotating cutter.

1 24. A device according to Claim 1 wherein the device comprises:
2 an outer tube that has a lumen and a distal end; and
3 an inner tube that has a lumen and a distal portion, said inner tube
4 extending through the lumen of the outer tube such that the distal portion of
5 the inner tube extends out of and beyond the distal end of the outer tube;
6 wherein the protector is located on the portion of the inner tube that
7 extends out of and beyond the distal end of the inner tube.

1 25. A device according to Claim 24 wherein the outer diameter of the inner
2 tube is smaller than the inner diameter of the outer tube such that fluid may
3 flow through the lumen of the outer and wherein at least one aperture is
4 formed in the outer tube to permit fluid to pass into or out of the lumen of the
5 outer tube.

1 26. A device according to Claim 24 wherein a power transmitting member
2 extends through the lumen of the inner tube to deliver energy to the tissue
3 ablating or cutting apparatus.

1 27. A device according to Claim 26 wherein the power transmitting
2 member is an electrically conductive member for delivering electrical energy
3 to the tissue cutting or ablating apparatus.

1 28. A device according to Claim 26 wherein the power transmitting
2 member is a light guide for delivering light energy to the tissue cutting or
3 ablating apparatus.

1 29. A device according to Claim 26 wherein the power transmitting
2 member is an ultrasound transmission member for delivering ultrasonic
3 energy to the tissue cutting or ablating apparatus.

1 30. A device according to Claim 26 wherein the power transmitting
2 member is a mechanical drive member for driving the tissue cutting or
3 ablating apparatus.

1 31. A device according to Claim 26 wherein the power transmitting member
2 is a rotatable drive shaft for rotatably driving the tissue cutting or ablating
3 apparatus.

1 32. A device according to Claim 1 wherein the tissue cutting or ablating
2 apparatus emits energy which causes cutting or ablation of tissue and
3 wherein the intensity and/or configuration of energy emitted by the tissue
4 cutting or ablating apparatus is such that a strip of tissue of substantially
5 predetermined width is cut or ablated.

1 33. A device according to Claim 24 wherein the protector is formed by
2 forming cuts in the distal portion of the inner tube and then bending at least a
3 part of the distal portion of the inner tube to form said protector.

1 34. A device according to Claim 33 wherein the protector is further formed
2 by applying an insulating material to the part of the distal end of the inner tube
3 that is bent to form the protector, thereby forming a protector having an
4 insulating material disposed thereon.

1 35. A method for manufacturing a device useful for cutting or ablating tissue
2 in a human or veterinary patient, the method comprising:

- 3 A) providing an outer tube and an inner tube;
- 4 B) positioning the inner tube within the outer tube such that a distal portion
5 of the inner tube extends beyond a distal end of the outer tube;
- 6 C) forming a protector on the distal end of the outer tube by
7 a. cutting at least one notch in the distal end of the inner tube to
8 form at least one leg, and

9 b. bending the first leg to form a protector having a first side and a
10 second side, and

11 D) positioning an electrosurgical cutting or ablating apparatus at the distal
12 portion of the inner tube and spaced apart from an adjacent the first side
13 of the protector.

1 36. A method according to claim 35 wherein the step of positioning an
2 electrosurgical cutting or ablating apparatus comprises forming an electrode
3 member from a portion of the inner tube.

1 37. A method according to claim 36 wherein the step of forming an electrode
2 includes forming a second leg in the distal portion of the inner tube.

1 38. A method according to claim 35 wherein the step of bending the first leg
2 comprises the first leg radially inwardly.

1 39. A method according to claim 35 wherein the step of forming the protector
2 further comprises applying an insulating coating on the first leg.

1 40. A method according to claim 36 wherein the step of forming an electrode
2 comprises forming a first electrode from a portion of the inner tube and
3 positioning an electrically conductive member including a second electrode
4 spaced apart from and adjacent to the first electrode.

1 41. A method for cutting or ablating a strip of tissue from a tissue mass,
2 said method comprising the steps of:

3 A) providing a device which comprises;

4 i. an elongate probe having a distal end;
5 ii. a tissue cutting or ablating apparatus; and

6 iii. a protector that extends from the probe, said protector having a
7 first side and a second side, said protector being positionable such that
8 tissue that is to be cut or ablated is adjacent to the first side of the

9 protector and tissue that is to be protected is adjacent to the second
10 side of the protector, said protector being at least partially formed of an
11 insulating material;

12 wherein the tissue cutting or ablating apparatus is useable to cut or
13 ablate tissue located adjacent to the first side of the protector without
14 causing substantial damage to tissue located adjacent to the second
15 side of the protector

16 B) positioning the device within or adjacent to the mass of tissue; and
17 C) advancing the device such that some of the in a first direction while
18 using the tissue cutting or ablating apparatus to cut or ablate tissue that
19 becomes positioned adjacent to the first side of the protector.

1 42. A method according to Claim 41 wherein the mass of tissue is *in vivo*.

1 43. A method according to Claim 41 wherein the mass of tissue is *in vitro*.

1 44. A method according to Claim 1 wherein the mass of tissue is located
2 within the body of a human or animal subject.

1 45. A method according to Claim 44 wherein the strip of tissue is removed
2 for a diagnostic or therapeutic purpose.

1 46. A method according to Claim 45 wherein the subject suffers from
2 glaucoma and wherein the method is carried out to remove a strip of
3 trabecular meshwork from an eye of the subject to facilitate drainage of
4 aqueous humor from the eye, thereby lowering intraocular pressure.

1 47. A method according to Claim 46 wherein Steps B and C comprise:
2 inserting the device into the anterior chamber of the eye;
3 advancing the protector through the trabecular meshwork of the eye
4 and into Schlemm's Canal;
5 advancing the device such that the protector moves through

6 Schlemm's Canal and the cutting or ablation apparatus cuts or ablates
7 trabecular meshwork tissue that becomes positioned adjacent to the first side
8 of the protector.

1 48. A method according to Claim 41 wherein the method is carried out to
2 form an incision in skin, mucous membrane, an organ, a tumor or other
3 anatomical structure.

1 49. A method according to Claim 41 wherein the device provided in step A
2 has at least one lumen formed therein and wherein the method further
3 comprises the step of:

4 C) removing fluid or matter through a lumen of the device.

1 50. A method according to Claim 49 wherein a lumen of the device is
2 attached to a source of negative pressure to aspirate the tissue or matter
3 through the lumen of the probe.

1 51. A method according to Claim 41 wherein the device has at least two
2 lumens and wherein the method further comprises:
3 infusing a fluid through one of the lumens; and
4 aspirating fluid and/or matter through the other of said lumens.

1 52. The device of claim 1 wherein the cutting or ablating apparatus
2 comprises a plasma generating apparatus which utilizes properties of plasma
3 to cut or ablate tissue.

1 53. The device of claim 1 wherein the cutting or ablating apparatus emits
2 infrared light.